

## PATENT ABSTRACTS OF JAPAN

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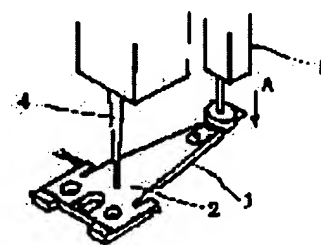
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**(54) MAGNETIC HEAD**

**(57)Abstract:**

**PURPOSE:** To provide a highly reliable magnetic disc unit wherein spring force can be regulated readily at high accuracy.

**CONSTITUTION:** Under a state where a load spring 1 constituting a head is pushed down, a spring 2 is irradiated with a laser beam 4 to partially remove stress therefrom thus regulating the spring force. Alternatively, the spring part 2 is split to provide a slack part and irradiated with a laser beam from lateral direction thus regulating the spring force.



## Translation re JP 5-159501 from JPO

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3. In the drawings, any words are not translated.

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### **CLAIMS**

#### [Claim(s)]

[Claim 1] The magnetic head characterized by making the spring force easy to save the submicron flying height, to prepare notching in the spring force fabrication section of this magnetic head in a lead and the magnetic head for magnetic disks which carries out a light, to irradiate laser from a longitudinal direction as structure which gave sag in the spring thickness direction partially, and to tune finely.

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### **DETAILED DESCRIPTION**

#### [Detailed Description of the Invention]

[0001]

[Industrial Application] this invention relates to the spring force adjustment method and magnetic-head structure of the magnetic head, especially adjusts the spring force easily and precisely using laser, and relates to the magnetic disk unit possessing the magnetic head which aimed at improvement in reliability.

[0002]

[Description of the Prior Art] Conventionally, the spring force of a magnetic-head spring has measured the spring force by stress meters, such as a load cell, at the back process, after fabricating the spring section at a predetermined angle beforehand by the press or the method of roller bending. When the measured value separates from default value, generally the method of returning in mechanism, or performing additional bending, and adjusting in default value is learned.

[0003] Moreover, if well-known [ of the method of irradiating the laser beam pulse converged on the spring force fabrication section as the spring section fabrication method with two or more numbers of scans which approached mutually ] is carried out and the degree of bending angle, as a result the spring force are made to agree correctly in a necessary value so that it may see to JP,1-227279,A, it is supposed that a fine-tuning process will become unnecessary.

[0004]

[Problem(s) to be Solved by the Invention] The spring force adjustment by the expert is required of the mechanism-spring force adjustment method in the above-mentioned conventional technology, and it is difficult for a springback to arise in the spring section and to adjust the spring force with high precision.

[0005] On the other hand, when a laser beam is irradiated by two or more scanning lines as a spring fabrication means, there is a problem which must carry out spring force fine tuning by

the final process by the handling in inside etc. if it takes that the spring force changes into consideration as an erector.

[0006] furthermore, the space of the vertical direction is surely the need, it becomes impossible to secure after HDA (HEAD-DISK-ASSEMBLY) and space with magnetic-head structure conventionally in the work which adjusts the spring force, and spring force adjustment is difficult -- etc. -- there is a problem

[0007]

[Means for Solving the Problem] By irradiating a laser pulse at the spring section of Rhodes pulling on one point or the conditions (load-on height, laser power) which were evaluated beforehand two or more points, it heats and cools momentarily and the trouble in the above-mentioned mechanism-spring force fine-tuning method is solved.

[0008] On the other hand, in the spring force adjustment method from the width in after HDA etc., the spring section is decomposed, and by making it the structure which slacked some springs, the laser radiation from width becomes possible and it is solved.

[0009]

[Function] In order to adjust the spring force, by the mechanism-adjustment method of giving plastic deformation to the spring section, it has the property that generally the spring force tends to change with time in a metal, by the springback etc.

[0010] then, in this invention, by depressing in the state where load-on of the spring section was carried out, generating spring stress, and irradiating laser in the position which carried out condition appearance beforehand and which was carried out, it can heat and cool momentarily and spring stress can be opened partially Spring force fine tuning which does not have a springback by this can be performed.

[0011] moreover, with the head of the structure which prepared sag in the spring section, it irradiates by the position and method which carried out condition appearance of the laser to the sag section beforehand, and made it it, and spring stress can be partially opened by heating, cooling or dissolving momentarily Thereby, the spring force adjustment from the side of a head spring without a springback is attained.

[0012]

[Example] Drawing 1 is drawing showing head structure conventionally, and the spring section 2 which gives the head spring force to a part of Rhodes pulling 1 attached in mounting 3 is constituted.

[0013] Drawing 2 is drawing showing the spring force fine-tuning method by this invention, is in the state which fixed the mounting 3 of drawing 1 , and is in the state where applied the force in the direction of A, depressed the Rhodes pulling 1, and the spring section 2 was made to generate spring stress. Height H which depresses the Rhodes pulling 1 shown in drawing 3 is determined by the relation with the amount of adjustments, and is evaluated beforehand. And laser 4 is irradiated by \*\*\*\*  $\phi 0.5\text{mm}$  at the spring section 2, spring stress is opened wide partially, and the spring force is adjusted. The amount of adjustments can also be performed it being possible to change with the strength of laser, an irradiation position, and the number of irradiation, and measuring by the load cell 5. Drawing 4 is head structure which shows this invention claim 2. The fine slot 61 is established in the head spring section 2, and it has structure which divided the spring section. Moreover, as shown in drawing 5 , you may form two or more these divided springs 6. Moreover, the spring 6 divided where Rhodes pulling is depressed needs to be the structure which swells to a \*\*\*\* [

spring / of both sides / 2 ], and the down side. Drawing 6 (1) As the example is shown in - (3), it is necessary to bend in the structure a spring 6 curtains, or the center, to prepare the section, and to make it the structure which protrudes positively in the state where the Rhodes pulling 1 was depressed to convention height.

[0014] Drawing 7 is drawing showing irradiating laser 4 from a longitudinal direction at the spring section 6, and adjusting \*\*\*\*\*, as a result the flying height, measuring the flying height of the magnetic head which surfaces by rotation of the glass disk 7. With the amount which adjusts the spring force, although the irradiation conditions of laser 4 differ, they are melting a part of heating, cooling, or spring section momentarily, and can perform adjustment of the stable spring force.

[0015] Moreover, as shown in drawing 8 , the spring force can also be adjusted, carrying out read/write after HDA, as a result adjustment of an electromagnetic property can also be performed.

[0016] Furthermore, even if it is not in a HDA state, a head simple substance can also perform, and flying height adjustment and adjustment of an electromagnetic property are possible. Even if it is not from a longitudinal direction about laser at this time, you may irradiate from a top or down.

[0017]

[Effect of the Invention] Like \*\*\*\*, by this invention, the fine-tuning method of the head spring force without a springback can be offered, it becomes possible to acquire the stable magnetic-head property in a final process, and the reliability of HDA can be improved.

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## DESCRIPTION OF DRAWINGS

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### [Brief Description of the Drawings]

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[Drawing 1] It is structural drawing of a head conventionally.

[Drawing 2] It is the side elevation of the head explaining the claim 1 of this invention.

[Drawing 3] Similarly it is the side elevation of a head.

[Drawing 4] It is structural drawing of the head explaining the claim 2 of this invention.

[Drawing 5] It is drawing showing other examples of this invention.

[Drawing 6] It is drawing showing other same examples.

[Drawing 7] It is drawing showing the application explaining this invention.

[Drawing 8] It is drawing showing an application similarly.

### [Description of Notations]

- 1 -- Rhodes pulling
- 2 -- Spring force fabrication section
- 3 -- Mounting
- 4 -- Laser
- 5 -- Load cell
- 6 -- Spring force controller
- 7 -- Glass disk
- 8 -- Magnetic disk
- 9 -- Head arm